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NEW YORK SUGAR MARKET.—An extremely active demand for refined stimulated the interest of our refiners in raw sugars, and led to considerable transactions at 3½c. for 96° Centrifugals, 3c. for 89° Muscovados, and 2¾c. for 89° Molasses sugars. These prices show an advance for the week of 1-16c. on Centrifugals and Molasses sugars, and ⅛c. on Muscovados. Sellers are asking a further advance, but buyers are showing no disposition to pay it, and, having supplied their immediate wants, are pursuing a waiting policy, which, however, cannot long be maintained as their melting requirements are very great and must be increased in order to meet the greater call for refined during the hot months.

NEW YORK SUGAR MARKET.—The raw market is firm, and indications are favorable that rates now existing will prevail for the immediate future. The market was firm at 3½ cents for 96 degrees centrifugals. Offerings from Java have attracted little attention so far, but there is every probability that purchases in India will be increased materially in view of the fact that the German and Austrian granulated, that formerly went to India in large quantities, must now be replaced by sugars not subject to the Indian countervailing duties.

ABOUT THE VOLCANO.—There is no good reason for any alarm regarding the volcano or its eruptions. Kilauea is a harmless volcano, being constantly open, and prepared for any discharges of lava that may flow out or around its ever open and sunken pit. The Volcano House is probably as safe a spot as any place on Hawaii. Little outbursts of molten lava occur now and then, down in the large crater, but such outbursts are perfectly harmless to those who visit the volcano. Even the lava streams that now and then burst out near the summit of Mauna Loa, flow over portion of the great mountain where there are no habitations, and consequently no damage is done. What the distant future may bring forth, when the end of the world approaches, is not worth while bothering about, but for the present generation at least, no one need be alarmed.

As the result of experiments, Wm. Lyman Underwood, of the Massachusetts Institute of Technology, has found that gold fish are efficient destroyers of mosquito larvae. Besides being ornamental, these fish can be made very useful. They will thrive in natural northern waters, and if introduced into many small bodies of water where mosquitoes are likely to breed, will prove a remedy for mosquitoes, preferable to kerosene.

FRUIT PACKING.—One of the first conditions for success in the packing of tropical fruit is that each fruit or bunch of fruits should be separated from the rest by some suitable packing material. Thus oranges are wrapped separately in paper. Under these conditions decay is prevented from spreading from one or two rotten oranges through the whole package. The decay of fruit is largely brought about by fungi.

SUGAR-CANE CROP IN EUROPE.—It is not generally known that the sugar-cane is still cultivated in Europe, especially in Southern Spain. According to a recent Consular Report: "Sugar-cane is grown all along the Coast of Malaga and the annual yield of sugar is about 30,000 tons. There are seventeen sugar factories in the provinces of Malaga and Granada, employing many thousand hands. Grinding generally begins about the middle of March. This year, it may commence earlier."

NEW VARIETIES OF BANANAS.—For some years efforts have been made by the Royal Gardens at Kew to obtain all the best varieties of bananas found in the far East, for the purpose of introducing them into cultivation in the West Indies. A collection comprising twenty-three varieties was received by the Imperial Department of Agriculture in 1898 and grown at Dominica and St. Vincent. Suckers from these have since been distributed to Jamaica, St. Lucia and Grenada. By a recent mail a second collection of bananas (in this instance obtained from the Straits Settlements) has been received from Kew.—Bar. Ag. News.

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HAS THIS EVER BEEN SURPASSED?

Ewa plantation on Oahu, twelve miles from Honolulu, reports what is believed to be the greatest yield of sugar per acre on record for a portion of the crop.

The product of 148.4 acres was 2,228 tons and 875 pounds, ground in June, 1902. The amount of cane per acre was 112.33 tons. The amount of sugar per acre was 12.2 tons. The average polarization of sugar was 97.02.

Any person who has ridden through the fields and observed the extraordinary growth of cane and noted also the splendid work in the mill, cannot fail to concede to Ewa the palm which she justly holds. This plantation is underlaid with a deposit of broken coral limestone, which, as it becomes pulverized by implements,—hoes, plows, harrows, cart-wheels and water, serves as a natural fertilizer, increasing the productive strength from year to year, as it becomes pulverized and

mixed with the surface soil. At the commencement of this plantation, some predicted its failure on account of this limestone; but the result has proved just the opposite, and it is barely possible that the yield of sugar may still go on increasing as the limestone becomes more pulverized and better mixed with the surface soil from year to year. At present, it looks as if Ewa contains the natural elements best suited for the production of sugar, and it certainly presents a very interesting subject for scientific investigation. Meanwhile the plantation keeps steadily increasing its annual output from year to year—though the same remark may apply equally well to other plantations throughout these islands, where skill and intensive cultivation are meeting with returns not surpassed in any other country.

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IMPROVING SUGAR CANES IN THE PHILIPPINES.

The chief of the Forestry Bureau of the Philippines, Captain Ahern, has undertaken the improvement of the sugar canes now growing there. He has brought a number of the leading varieties from Hawaii and hopes to bring about in Manila some improvement in the yield of cane from the lands and of sugar from the cane, approaching in degree the splendid results already reached in Hawaii. As the descendants of New England missionaries, with their natural ability, capital and experience, have been the chief factors in producing the splendid results accomplished in Hawaii, we are not surprised at them. It is quite another matter when we come to deal with the Spanish Filipino, and it will be many years before he reaches Hawaii's record. Our Dutch confreres in Java, with their sturdy persistence and great intelligence, have accomplished wonders and are now giving the world its chief supply of cane sugar.—La. Planter.

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Beet and Cane Sugars in Europe.—The central committee of the sugar industry has recently made public its estimate of the crops in Europe for 1901. There was a 5 per cent increase in the acreage planted in beets in Austria-Hungary last year, making a total of 803,000 acres sown during 1899-1900. The crop amounted to 8,400,000 metric tons, or 800,000 metric tons more than in preceding years.

A resume of the output of beet cane sugars in European countries may be made as follows.

Country.	1898-99.	1899-1900.	1900-1901.
	Tons.	Tons.	Tons.
Beet sugar:			
Austria	1,042,000	1,099,000	1,070,000
Germany	1,720,000	1,791,000	1,900,000

Country.	1898-99.	1899-1900.	1900-1901.
Beet Sugar:	Tons.	Tons.	Tons.
France	782,000	919,000	1,070,000
Russia	755,000	898,000	900,000
Belgium	209,000	270,000	320,000
Holland	150,000	170,000	170,000
Denmark	40,000	41,000	50,000
Sweden	60,000	81,000	110,000
Roumania, Italy and Spain.	40,000	110,000	160,000
Total	4,798,000	5,379,000	5,750,000
Cane sugar	2,654,000	2,442,000	2,907,000
Grand Total	7,452,000	7,821,000	8,657,000

These figures show an increase of 371,000 tons of beet sugar and 465,000 tons of cane sugar over previous years.

The market price of sugars is almost a fixed quantity, the fluctuations being exceedingly slight; and, as long as the sources of supply can be approximately estimated, the price of this staple article can be assured.—U. S. Consular Rep.

New Lady Birds.—In a cage constructed of mosquito netting in the grounds of the Department of Agriculture, Professor C. L. Marlatt is fostering a colony of "Chilocorus similis" lady birds. Some months ago Mr. Marlatt went to the Orient in search of the natural enemy of the San Jose scale which has played such havoc with the peach orchards of this country and there found that the above named insect preyed upon the scale with extraordinary ferocity, keeping the plague under control. He found the Chilocorus in China between Pekin and the Great Wall. He immediately shipped a large number of the "ladys" to this country, but only two survived the trip. Under the tender nursing of Mr. Marlatt, who has spent his entire time since returning capturing scales for their food and keeping up the fires, they have produced a danty little family of ninety-nine members and some of their offspring are already preparing to start establishments of their own, despite the discouragement which the beef trust is offering to those contemplating matrimony. As soon as a census of the colony reveals a population of a few thousand the Professor will turn it loose upon an emaciated and almost defunct peach grove which is suffering from the ravages of the scale and he thinks at least some of the trees will be saved. In time it will be policy of the Department to distribute the "ladies" among orchardists.—Sonoma Cal. Farmer.

THE MOTH BORER IN SUGAR CANE.

Throughout the West Indian islands the sugar cane crop is now being reaped and the young canes have attained a certain height. This is the best season for fighting the moth borer by cutting out dead-hearts and collecting the eggs. The work now done, in this way, will produce the greatest result for the least expenditure of time and effort. In Barbadoes there appears to be no lack of moth borer this season and it is to be hoped another year will not be allowed to go by without a more determined effort being made in all sugar growing colonies in the West Indies to combat this pest wherever present. The insect and the remedies recommended for it have been fully discussed and full information may be found in the West Indian Bulletin.

Egg collecting is the simplest and cheapest remedy, and careful work in this direction would prevent the later occurrence of dead-hearts, since it destroys the pest before it can do harm. In a dry season, such as the present, planters hesitate to cut out many shoots in the young canes but there need be no hesitation in cutting off the eggs on the leaves. Having got the eggs they should be spread out in the sun near the young canes so that the parasites (those friends of the sugar planter) may escape and find their way back to the canes. At this time of the year there are few parasites in the eggs. In a batch of 500 egg clusters recently collected on an estate in Barbados, only one per cent showed parasite attacks; but as the season advances and the parasites have less difficulty in finding an abundance of eggs on the young canes, this proportion will grow much larger.

The planter can do much to encourage the increase of the parasites, so that by the time the canes are getting too tall to be searched for eggs the parasites become numerous enough to do very effective work in checking such moth borers as may still be found in the canes. The time for this work is necessarily short, but the opportunity should not be allowed to pass this year.—Barbados Ag. News.

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WIRELESS TELEGRAPHY BETWEEN CANADA AND GREAT BRITAIN.

The Government of the Dominion of Canada has concluded an agreement with Signor G. Marconi for the establishment of the Marconi wireless process of transmitting messages between Canada and Great Britain. The agreement in detail is as follows:

(1) Marconi's Wireless Telegraph Company, Limited, agrees to erect two wireless telegraph stations—one in En-

gland and the other in Nova Scotia—the object of which, should the undertaking prove successful, is to carry on communication on a commercial basis between the Dominion and the United Kingdom of Great Britain and Ireland and the continent of Europe.

(2) The Canadian Government agrees to contribute to the company the sum of $80,000, or such lesser sum as may be required, for the purpose of the erection of a station at a point in Nova Scotia according to plans and specifications approved by G. Marconi—and should the cost be greater than $80,000, then the excess shall be paid by the company—payments to be made as the work progresses.

(3) The Canadian Government undertakes that all messages received by the company or intended for transmission by the company shall be sent over all Government lines of telegraph in Canada now in operation, or that may be hereafter constructed or operated by the Government, at rates not higher than those charged to others for commercial messages.

(4) If the company enter into any arrangement with companies operating telegraph lines in Canada as respects the division of rates on through messages, the company will not grant less favorable terms for all similar arrangements with the Government land lines.

(5) The company agrees that the rates to be charged for messages between Canada and the United Kingdom shall not in any case exceed the rates charged for similar messages between the United Kingdom and any other portion of North America.

(6) In consideration of the encouragement which it is proposed shall be given by the Canadian Government, the company will undertake, if its operations prove successful, as they fully expect them to, to transmit general messages to and fro between any station or stations which it may establish on the Atlantic coast of Canada for that purpose and any corresponding station on the coast of the United Kingdom at rates which should be fully 60 per cent less than the rates now charged for cablegrams between Canada and Great Britain; that is to say, that whereas the present rate per word for such general messages is 25 cents, the company will undertake to charge not more than 10 cents per word for such messages; the company further to agree that the Government messages for the press shall be transmitted at a rate not exceeding 5 cents per word.

(7) The company will, as far as possible, use Canadian machinery, material, and labor in the construction of the station in Nova Scotia.

(8) If the Government desire to use the Marconi system for communication with any of the light-houses or life-saving

stations on the coast, or between the mainland and any island within the jurisdiction of Canada, or with any ships passing to and fro, or in any way to assist in its operations for the protection of life and property on the seacoast or inland waters of Canada, or for the improvement or assistance of navigation, the Government shall be free to erect all such stations as it may require for such purpose and the company shall be bound to furnish all machinery and apparatus required for such stations at fair and reasonable prices, free from any charge for patent rights or royalties thereon, it being understood that the assistance hereby provided by the Government shall cover and include all charges for such patent rights or royalties.

(9) Such stations when established by the Government shall receive all messages sent by ships equipped with the Marconi system and deliver them to the connecting land lines without any charge, and the tolls for all such messages shall be collected by the agents of the company on board the ships from which they are sent and shall belong to the company. The Government shall be entitled to receive for its own use all tolls collected at its stations for messages transmitted to ships passing to and fro.

(10) Sections 8 and 9 shall be subject to the following conditions: That whereas certain arrangements have been made between the company and the corporation of Lloyds, in London, respecting transmission of messages from ships to stations on land, and whereas questions may arise respecting the right of the company to grant the privileges of such said sections to the Government without the consent of Lloyds, the company undertakes that, if necessary, it will use all reasonable efforts to bring about a friendly and satisfactory arrangement between the Government and the corporation to the end that the privileges provided in said sections 8 and 9 may be enjoyed by the Government; and if it be found that in consequence of such agreement between the company and the corporation the privileges provided in sections 8 and 9 can not be granted to the Government, then the sections shall be void, and in that case the sum to be contributed by the Government to the company toward the construction of its trans-Atlantic station in Nova Scotia shall be reduced from $80,000 to $50,000.

Any light-house or station maintained by the Government of Canada on the coast of Newfoundland shall be deemed, for the purpose of this agreement, to be a part of Canada, and all privileges which the company is bound to grant to the Government in Canada shall extend to such light-houses and stations, in so far as the company has the power to grant them at such places.

DOES SUGAR CANE EXHAUST THE SOIL?

Question.—For some years my land (scrub) has produced good crops of cane, but of late the crops have been almost too light to pay for cutting and loading. Yet I can get very good crops of corn or potatoes off the same land. Has the cane exhausted the soil?

Answer.—There is practically no such thing as an exhausted soil, but the available plant food near the surface may have been exhausted. In your scrub soil there is plenty more of the plant food which sugar cane requires, but it is out of reach of the roots, and requires to be brought up either by subsoiling or by growing nitrogen-producing plants. Again, the soil cannot be exhausted, as you say you can get good crops of corn and potatoes from the land. It is the plant food needful for cane which has been carried off year by year till little is left. A glance at the following table will at once show you the reason for the failure of cane crops.

Crops remove from the soil plant food in the following proportion:—

	Nitrogen.	Phosphoric Acid.	Potash.	Lime.
Sugar cane	127	44	298	71
Wheat	43	23	36	16
Barley	47	23	54	11
Maize	61	31	66	14
Rice	41	26	68	10
Potatoes	26	13	48	2
Cotton	54	19	40	25

From this, you can at once see that sugar-cane extracts from the soil about five times as much nitrogen, three times as much phosphoric acid, and six times as much potash as do potatoes.—Queensland Ag. Jour.

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THE PRODUCTIVENESS OF HAWAII.

The U. S. Census Bulletin of May 19 reviews agriculture in Hawaii and incidentally gives some interesting data concerning the sugar industry there. In the whole territory there were 65,687 acres of land planted in sugar cane in 1899 and from this land there was produced 2,239,376 tons of sugar cane or a shade over 34 tons per acre. The land in sugar cane is three-fourths of the area of cultivated land and the sugar cane produced reaches in value four-fifths of all crops.

Sugar and molasses were made by the operators of 42 plantations, 30 of whom consumed only their own cane, while 12 bought outside cane also. Four large sugar houses in process of construction have since increased these establishments to

46. Two of the sugar houses raised no cane for their own account.

The cane from 138 farms was sold to the sugar houses, producing an average of 1,250 tons of cane per farm, while the 46 plantations with sugar houses produced an average of 44.431 tons, short tons, of sugar cane each.

The element of fertilization stands out prominently. To produce 2,239,376 tons of sugar cane there was expended for fertilizers $1,326,407—or about 60 cents per ton of cane produced and on the average of 34 tons production per acre Hawaii fertilizes her cane lands at a cost of about $20 per acre. We believe that such intense cane culture as this has never been attempted in Louisiana. The cost of raising sugar cane and delivering it to the factory is placed at $4.30 per ton.—La. Su. Planter.

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SUGAR CANE CULTIVATION IN HAWAII.

The cultivation of sugar cane and the manufacture of sugar says a Penang planter, is without doubt more carefully studied and carried on in a systematic manner in the Hawaiian Islands than in any other part of the world.

The irrigated low lands produce the largest crops, for the simple reason that by the regularity of the application of water the growth of the cane is a sturdy one and never suffers from dry spells. Good crops in the Hawaiian Islands produce about 126,000 pounds of cane, or 18,000 pounds of sugar per acre.

Most of the flourishing plantations previous to the annexation of the islands by the United States of America, which brought about a considerable rise in the price of labor, produced sugar for less than $35 gold per ton. Labor at that time cost about 50 cents per day, while at this time it is about $1 gold, with a tendency to rise.

The analyses of the soil, and the application of proper fertilizers, has for the past few years been a matter of great advancement in the sugar industry.

Soil that would, without fertilizers, produce 4 or 5 tons of sugar per acre, will, with the application of suitable fertilizers, produce about double the outturn.

No expense or trouble is spared in having the soil analyzed by experts, to find out what particular fertilizer would be most suitable, and what sort of cane would be likely to thrive best.

Seed is freely exchanged between the planters on the different islands. The theory of fertilizing is, that it is necessary to put back into the soil just what the cane takes out of it, and in that way always keeping the soil up to par.

The highest return per acre on the island before I left, was 120 tons of cane or about 14 tons of sugar. This I am afraid will hardly be credited by planters here. I have worked on some plantations, sections of which gave 10 and 12 tons per acre, which I am told is far ahead of any outturn here, only I see no reason why the same results could not be had in these parts. From what I have gathered, the climate and soil are equally good, all that is wanted is proper cultivation and a good sort of cane.

I am simply writing from hearsay, as I have seen no plantations here, and beg to apologize if any of my statements are incorrect as regards the outturn in the Straits Settlements.

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MACHINES TO HARVEST SUGAR CANE.

There are few industrial contrivances in the economization of labor that have persistently baffled the brains of inventors without ultimate success; but the case to which they confess defeat all along the line is the invention of a machine to cut cane. Every cane growing latitude on earth has held out tempting pecuniary inducements to the whole mechanical world now, and for years to meet the case. It has attracted the best mechanical skill of every country, not so much for the award as the enormous royalty a successful patent would mean to the author, as that the successful invention of such a machine would commercially place cane sugar beyond all rivalry, cause the universal introduction of mechanical means to carry on the entire work of cultivation, the suspension of the huge traffic in Asiatic labor, and a correspondingly immense saving in the cost of production, and the final overthrow of beet as a dangerous rival. But it would appear that viewed from either a practical or economic point of view to be impossible. So far as economy is concerned nothing has been attempted yet by which a saving is effected, whilst the practical conditions are admitted to be insurmountable. The idea that mere mechanical actions must of necessity mean economy, has already broken the anticipations of many leading inventors and will continue to do so while they are ignorant of the true rudiments, or the natural, practical and financial conditions of the work they attempt to economize. One would imagine that the first effort to make is, how to grow cane, before attempting to invent machines to cut it, but these attempts are only confined to people who understand their business and like the growers, have infallible belief in their own large capacity and oceans of confidence in Providence. Expert mechanicians, however, who thoroughly understand what, how and must be done in cutting cane, and what the

varied conditions ranging from a few tons to a large tonnage means, recognize not only difficulties, but absolutely insurmountable obstacles, that compel the conviction and couple the idea of perpetual motion to be as likely accomplished as the invention of a machine that can cut cane. In that case the usual position must be reversed and a special variety of cane grown for the machine. There are certain varieties that grow perfectly straight, attain a fairly uniform height, yield a good tonnage, high in sugar content and in this direction alone lies the successful solution of a cane cutting machine. It may be taken as certain, however, that the variety of cane that yields the heaviest crop that must necessarily be cut by manual labor will score every time.—Sugar Journal.

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A GERMAN VIEW OF AMERICAN PROSPERITY.

Under the striking title of "The American danger," the Hamburger Fremdenblatt of December 8 presents on its front page an editorial article, based upon the annual report of the Secretary of the United States Treasury, which is herewith translated as follows:

The statement in the annual report of the finance minister of the United States that the national revenues have increased by $58,500,000 and the expenditures decreased by $117,000,000 merits serious attention. The United States had only a few years ago to struggle with not inconsiderable annual deficits in the national revenues; it has regularly sent abroad—principally to England and Germany—a large part of the interest on national bonds and a considerable share of railway and industrial securities, and has had to make for more than ten years past a yearly appropriation for the pensioners of the war of the rebellion larger than the cost of the German army and navy. The Union has had to meet more recently the heavy cost of the war with Spain, and its industries have to reckon with considerably higher wages and higher rates of interest than the European countries. In spite of all this, the national budget of the United States shows the favorable balance which is announced in the annual report of the Treasury. The reasons for this are made plain by the report itself, from which may be learned much more that is timely and valuable.

We see, for example, from the table of exports and imports that the United States exported during the last (fiscal) year goods valued at $1,394,483,682, of which more than $1,370,000,000 was of domestic origin. In these gigantic figures—one must compare them with the export statistics of European countries to realize their full significance—the item of manufactured goods amounted to 31.54 per cent; that is,

nearly a full third of the whole export. To appreciate this fact, it must be remembered that in the year 1898 only 28 per cent, in 1895 only 23 per cent, and in the year 1890 only 17 per cent of the total exports were the products of manufacturing industries. These figures mean more than they alone say. They speak a threatening language; they say clearly and forcibly that the United States, which ten years ago exported more than 80 per cent of agricultural products and less than a fifth of manufactured goods, to-day draws nearly a third—more than 14 per cent more—of its entire export from the products of its factories. In other words, the Union is marching with gigantic strides toward conversion from an agricultural to an industrial nation.

This will be more apparent if we consider the export statistics of the years 1899 and 1900 from another standpoint. We see that the value of industrial products exported during the fiscal year 1899 was $339,592,146, while that of the fiscal year 1900 was $432,284,366, an increase of a round $100,000,000 or 27 per cent, in a single year. Do not such an enormous increase and the correspondingly rapid progress in productive and selling capacity constitute an imminent danger for all competing nations?

Similarly interesting is also the influence of this development of export trade. The Union came out of the civil war during the early sixties with one of the heaviest national debts recorded in history. This debt was for the most part paid far earlier than the world, or even the Americans, expected, and it was paid mainly by the export of agricultural products. When, about twenty years ago, the industries of the United States began to revive, and under the protection of exorbitant duties developed and strengthened, they suffered in all branches—often seriously—for want of domestic capital. The great transcontinental railways were built partly—in some cases, principally—with foreign—principally English and German—money, and similarly different great industries were obliged to draw capital directly or indirectly from Europe to extend and increase their facilities. The natural result of these conditions was that Europe held a large share of the railway and industrial securities, on which the Union had to pay interest abroad, and, since this interest was payable in gold, there was a strong and constant outflow of the yellow metal, to the injury of the financial situation at home. From this it resulted that during many years the imports from Europe reached higher figures than the exports from the United States, and the resulting adverse balance had to be paid to Europe—likewise in gold. This was the cause of the constant scarcity of money, especially gold, which during the later eighties and the early nineties, in

connection with the then unstable financial politics of the Government, repeatedly brought the gold reserve below the legal limit for the protection of the currency and necessitated at that time a new loan and new gold imports and an increase of interest to be paid to Europe. Things went so far that the United States became financially wholly dependent upon Europe, and the rate of interest was practically dictated from London.

From the beginning of the past decade, a series of different factors caused a decided change in this situation. Several unusually good harvests succeeded each other, and two of these, coming in conjunction with bad crops in Russia, changed the balance of trade in favor of the United States and brought a corresponding flow of money to America, instead of from that country to Europe. Numerous industries, among which were many gigantic undertakings, were in part newly established, partly enlarged, through the assistance of the protective tariff on their products. These found, in consequence of the rich harvests and the active building of railways and new industries, an eager market at home and an increased demand abroad. These industries were promoted not only by such favorable conditions, but still more through practical and highly improved processes and the use of labor-saving machinery; as a result of which they were soon able to emancipate themselves wholly from foreign capital and through the strengthening of domestic financial conditions to reduce the rate of interest to a normal figure. As soon as the American industries thus got upon their own footing and were in a position to support the railroads, which were strengthened by increased freights and the gigantic harvests, and were thus brought into a greatly improved financial condition, they likewise undertook the task of freeing themselves from foreign capital—in other words, of reclaiming the industrial securities which were in European hands; and then, sustained by the protective tariff against foreign competition, they began to dominate foreign markets—first, those of Central and South America, Asia, and Africa, and finally those of Europe. The change in the condition of the United States can best be characterized by the statement that the industries, trade, agriculture, railroads, and finances of the Union each and all climbed, one upon another, through and by each other, steadily upward. And to what a height have they climbed!

The United States, in the year 1899, mined 3,437,210 ounces of gold, valued at $71,053,400, and silver with a bullion value of $32,858,700 and a coinage value of $70,806,626. That raised the specie supply of the Union to $1,034,439,264 in gold and $647,371,630 in silver. Since the total gold and silver coinage

of the world during the calendar year 1899 was $466,110,614 in gold and $166,226,964 in silver, and the total money supply of the world on the 1st of January, 1900, was $8,659,900,000 in coin and $2,960,100,000 in paper currency, the United States finds itself in possession of one-fifth of the entire gold and silver money of the civilized world.

If we now turn to an investigation of all the elements which have produced this tremendous, this almost incredible, revolution in the world's situation, it is impossible within our present limits to consider all the factors which are of importance to German interests as well as essential to a comprehensive conclusion. Competent experts, well informed as to the industrial and export conditions which prevail in the United States, have established the following facts:

The steel manufactories of the United States, which two decades ago were in their infancy, today control the markets of the world, dictate either directly or indirectly the prices of iron and steel in all countries, and—partly through the richness of their supply of iron ores and coal, partly by the use of labor-saving machinery and skillful, effective means of transportation—have attained a position to not only compete with the older iron-and-steel-producing countries, but even to profitably export their products to England. American tools, especially hatchets, axes, files, saws, boring implements, etc., enjoy by reason of their excellent quality the best reputation, and, in spite of their higher price, stand above competition in nearly the whole world. * * *

Incidentally, it may be remarked that the typewriting machine with which this article is written, as well as the thousands—nay, hundreds of thousands—of others that are in use throughout the world, were made in America; that it stands on an American table, in an office furnished with American desks, bookcases, and chairs, which can not be made in Europe of equal quality, so practical and convenient, for a similar price. The list of such articles, apparently unimportant in themselves, but in their aggregate number and value of the highest significance, could be extended indefinitely. But it would seem more interesting and characteristic to cite the fact that an American syndicate is now planning, and has even taken the initial steps in a scheme, to take in hand the whole sleeping-car service of Europe, to improve it and make it cheaper than is now possible. Moreover, American manufacturers of underclothing, gloves, and men's clothing, as well as women's cloaks—all articles which a few years ago were exported in vast quantities from Europe to the United States—are already beginning to calculate how they can place their surplus output in European markets.

But enough of examples. Everyone who understands the

existing conditions and has followed these conclusions, drawn from the best sources and based upon thorough knowledge of the facts, will agree that the threatened danger from America is neither exaggerated nor painted too darkly, but is, in fact, real and serious. But the mere recognition of the peril avails nothing; what is demanded is to face it, to overcome it, or at least to minimize as far as possible its effects. We must ask ourselves whether this is still possible, and, if so, what are the means, the methods, that must be employed to secure a successful result. There is but one answer to this question. We must fight Americanism with its own methods; the battle must be fought with their weapons, and wherever possible their weapons must be bettered and improved by us. Or, to speak with other and more practical words, Germany —Europe—must adopt improved and progressive methods in every department of industry; must use more, and more effective, machinery. Manufacturers as well as merchants must go to America, send their assistants and workingmen, not merely to superficially observe the methods there employed, but to study them thoroughly, to adopt them, and wherever possible to improve upon them, just as the Americans have done and are still doing in Europe.

FRANK H. MASON,
Consul-General.

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[We have received the following notice from the U. S. Department of Agriculture with the request to publish the same.]

IMPORTATION OF REPTILES INTO HAWAII.

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., May 22, 1902.

Under the provisions of section 1 of the act of Congress approved May 25, 1900, entitled "An act to enlarge the powers of the Department of Agriculture, prohibit the transportation by interstate commerce of game killed in violation of local laws, and for other purposes," the Secretary of Agriculture is authorized to regulate the introduction of birds and animals in localities where they have not heretofore existed, and to make and publish all needful rules and regulations for carrying out the purposes of the act.

In accordance with the authority thus conferred, and for the purpose of preventing the introduction of noxious reptiles into the Territory of Hawaii, the order issued under date of September 13, 1900, extending the list of foreign animals and birds which may be imported without permits (Circular No. 30, Biological Survey) is hereby amended, so that on and after July 1, 1902, and until further notice, permits will be

required for the entry of reptiles at all ports of the Hawaiian Islands. Such permits will be issued by the special inspector of this Department in Honolulu in the same form and subject to the same regulations as those now issued for mammals and birds. But no permits will be issued for the entry of poisonous snakes of any kind. All applications for permits to import reptiles into Hawaii should be addressed to the Special Inspector of Foreign Animals and Birds, Bishop Museum, Honolulu, Hawaii.

Under the regulations prescribed by the Secretary of the Treasury, under date of June 28, 1900 (Circular No. 101, Divisions of Customs), persons who have not already secured permits will be allowed a reasonable time in which to secure them after the arrival of the shipment at the port of entry. In case the application for entry is not granted, or the required permit is not obtained in due time, the reptiles will be immediately exported or destroyed at the expense of the owner or agent.

JAMES WILSON, Secretary.

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KARTELS.

In a report which he presented to the United States' Committee of Ways and Means on the proposed abrogation or reduction of the duty on the sugar imported from the island of Cuba, Dr. H. W. Wiley, chief of the Bureau of Chemistry of the U. S. Department of Agriculture, gives the following interesting information about Kartels:—

Another difficulty which the producers of raw sugar for legitimate markets have to contend with is the so-called "Kartel," lately formed in Germany and Austria for the purpose of controlling the output of refined sugars in those countries by fixing a minimum price which raw sugar sold for refining for home consumption should receive. This combination is perhaps best described as what we know as a trust, and we are informed that it has among its members 95 per cent. of all the raw sugar producers of those two great countries. The basis of this combination is the prohibitive customs tariff, which is laid upon sugars entering both Austria and Germany. For sugar imported from foreign countries to Germany this prohibitive tariff amounts in round numbers to almost $100 per ton, which is almost 5 cents per pound.

In addition to this an excise duty is collected on sugar for home consumption, amounting to about one-half this sum or 2½ cents per pound. Now it is this difference between the excise tariff and tariff on importation, which makes it possible for the sugar refiners of these countries to artificially raise the prices on sugar to home consumers. It is evident that this difference, amounting to 2½ cents per pound, can be completely controlled by a combination which practically includes

all the sugar producers and sugar refiners. Under the "Kartel" the refiners guarantee to the makers of raw sugar a price of 12.75 marks per 50 kilograms for home consumption. Since a mark is almost exactly 24 cents and 50 kilograms almost exactly 110 pounds, it is not difficult to produce this price in pounds, viz: 2.780c. per pound. Now, the difference between this price, and that which is paid at Magdeburg, as the regular market price for export, is a most remarkable one.

From the "Centralblatt fur die Zuckerindustrie," published at Magdeburg, on the 11th day of January, 1902, I take the following quotation of the market price of sugars for export at that city on the 9th of January. This price on the 9th of January at Magdeburg was 6.40 marks, while the price guaranteed to the home consumer was 12.75. The difference between this price for export and the price guaranteed the seller of the same sugar for refining for home consumption would represent the sum of all the bounties paid on sugar. This difference is 6.35 marks. The direct bounty on which we countervail is 1.25 marks. To get the amount of indirect bounty which comes from the operation of the "Kartel" we simply subtract the direct bounty on which we countervail; namely, 1.25 from the total bounty, namely, 6.35, and we get as a result 5.10 marks as the indirect bounty received by 110 pounds of sugar for export to the United States. Multiply this by 24 and divide by 11 gives 1.11c. per pound. This is the apparent bounty due to the "Kartel" on the sugar exported, but the real amount of this bounty is only determined by considering the ratio between the total production in Germany and the home consumption. Now, all the estimates of German production agree in stating that it is almost three times the home consumption. Without going into further calculations we may safely presume that the ratio of export to consumption is as 2:1. Therefore the apparent bounty of 1.11c. per pound must be divided by 3 to allow for the whole crop produced in Germany, making a real bounty of .37c. per pound.

Effect of the Kartel.—The effect of the "Kartel," therefore, is to pay an indirect bounty of nearly .4c. per pound on every pound of raw sugar exported from Germany. Now the direct bounty on this sugar which is countervailed by our present law is .275c. per pound. In order to fully protect our markets, however, the indirect bounty must be added to this, making a total bounty which should be countervailed of .675c. per pound.

This simple illustration will suffice to show, without going into further detail, the effect of the "Kartel" upon the world price of sugar.

On the face of the "Kartel" it would not seem probable that the magnitude of the bounty would be so great as represented above. On the 1st of June, 1900, when the "Kartel" went into

effect it was not foreseen that the price of raw sugar would fall to the point it has now reached. For this reason the terms of the "Kartel" as originally drawn did not guarantee a greater sum than 3.40 marks benefit to the maker of raw sugar. In other words should the price of raw sugar go below 9.35 marks per 50 kilos, the loss would have to be borne by the producer and not by the "Kartel." If for instance raw sugar should sell for 8 marks per 50 kilos—only 3.40 marks were absolutely guaranteed instead of 4.75. Thus from the terms of the "Kartel" as at first established the bounty to the producer could not exceed 3.40 marks per 50 kilos in any case. It seems perfectly certain, however, that greater bounties have been corresponding to the unexpected decline in price produced chiefly by the operation of the "Kartel" itself.

For instance, on the 21st of last November the price of German refined loaf sugar in London was 10-6 per 100 kilos. Converting for convenience into marks—we have:

	Marks.
Price refined sugar in London	20.62
Direct bounty on export	3.55
Import duty	20.00
Total	44.17

The legitimate price of this sugar therefore to German consumers on that date was 44.17 marks. But in reality, the German wholesale price fixed by the Kartel on that date was 56.90 marks per 100 kilograms. The total Hochin of the Kartel therefore was 56.90—44.17=12.73 marks per 100 kilos or $3.06 per 220 pounds, equivalent to 1.39 cents a pound.

Compare in cents per pound the wholesale price of German loaf sugar in London and Magdeburg, November 21, 1901.

Price per pound in London, 2.22 cents.

Price per pound in Magdeburg, 6.02 cents.

The most striking effect of the operation of the "Kartel" is found in the relative effect it has had on the price of refined sugars in the London and Magdeburg markets. For convenience this comparison is given in our currency for 110 pounds from the time the "Kartel" first began to make itself felt in the world's markets, viz: June, 1900 to 1901.

Price granulated sugar per pound:

	London.	Magdeburg.
June 1st, 1900	$2.40	$6.07
December 1st, 1901	2.10	6.82

No argument would be more convincing than the above comparison. The Kartel has enormously raised the price of sugar to home consumers, viz: to the extent of 12.4 per cent, and thereby has secured a corresponding reduction in the price to the English consumer—viz: 12.5 per cent!

According to the "Journal des Fabricants de Sucre" for the 25th December, 1901, from June 1st, 1900, to December

1st, 1900, the total sum extorted from the German people by reason of the "Kartel" is 150,000,000 francs or nearly $30,000,000! Of this sum about $10,000,000 has been paid to the producers and the rest has remained with the refiners.

But the "Journal" adds: "But since it (the "Kartel") has not yet paid over all the bounty due the makers of raw sugar its benefits are superior to that figure. In fact the German refiner, like his brother in Austria, is the principal beneficiary of the Kartel." Apparently the sugar refiner is the same the world over—and what may be said of him in one country is applicable to *"id genus omne."*

Two Cases of Low Prices.—As a further proof that I have not placed the bounty due to the "Kartel" too high I will give the calculation of the "Journal des Fabricants de Sucre" for January 1, 1902." "If we consider the bounty *en bloc* it can be said that since the beginning of the Kartel, June 1st, 1900, up to the end of November, 1901, the extraordinary levy on consumption was 158,898,750 francs. If we compare this sum with the quantity of raw sugar exported during the same period, viz: 1,560,804 tons, it is seen that the Kartel has taxed German industry 10 francs for every 100 kilos of sugar exported. To this bounty must be added the direct premium on the quantity exported, viz: 46,824,120 francs, and the total bounty on the 1,560,804 tons amounts to 205,723,000 francs! It is objected to this statement that the books of the Kartel show that during the period named only 19,782,167 marks were paid to the raw sugar makers. Not having these books, it is difficult for us to know how this figure is established. But if it is exact, that does not discredit our own figures, viz: those resulting from the mode of calculation indicated by the promoters themselves of the Kartel. It proves only that the refiners have kept the lion's share."

It is a proper supplement to this argument to say that the public and private cables from Brussels indicate that the English representatives at the Conference now sitting in Brussels to discuss bounties, both direct and indirect on sugars, have stated to this Conference, by authority of their government, that if these bounties are not abolished, England will follow the lead of the United States and will place a countervailing duty on sugar imported into Great Britain equivalent to both the direct and indirect bounties which they have received.

It is evident that the magnitude of the bounty due to the "Kartel" will always depend upon the ratio of production to consumption in the countries where the "Kartel" exists. For instance, if Germany today consumed as much sugar as the United States, the "Kartel" would absolutely have no effect upon the price of export sugars, because then her production would just equal her consumption, and the price of sugar to the consumer would be the cost and profit of production and

the margin between this sum and the import duties on foreign sugars. But it is evident from the high bounty already existing in Germany, and the rapid progress which her beet-sugar industry is making, that the bounty arising from the "Kartel" will continue to increase rather than diminish. It is possible that the cost of sugar to the consumer in Germany can be increased to the extreme limit of the difference between the excise and import tax; namely, 2½c. per pound, and if the "Kartel" should push its power as far as this, the consumption of sugar in Germany would doubtless be greatly diminished. At the same time the stimulus which this action would give to production by enabling German producers to undersell all their competitors in the world markets would increase the output of sugar. Thus, the evil which the "Kartel" bounty produces tends to increase rather than diminish by its own operation, and this evil influence will continue to be felt more and more oppressively until the great sugar consuming nations of the world, namely, England and the United States, take such concerted action as will at once and forever annihilate all forms of bounty, direct and indirect.

From the above resume it is seen that the low price of sugar prevailing over the whole world is the result of two causes. The first is a perfectly legitimate cause, namely, the cheapening of the price of production by the application of a scientific process of agriculture, in the production of the raw material and the application of a more perfect technique in the factory, coupled with a remunerative disposition of by-products. This kind of sugar cheapening is to be universally commended, since it results alike to the benefit of the sugar maker and the sugar consumer.

The second cause for the low price of sugar is due to over-production resulting directly from the application of the direct and indirect bounty system, which has already been described. This is a form of cheapening sugar which is universally reprehensible, since in the end it will prove disastrous both to maker and to consumer of this article.

An Illogical Argument.—The application of import duties on sugar by various countries never tends to reduce the price of sugar but always to raise it. And hence the argument against a protective tariff as the cause of a low price of sugar is illogical and based upon an entire misapprehension of facts. It follows as a logical conclusion, therefore, that the people who come to this committee for a relief from the price of low sugar should strike at the true cause and not the false one, of the evil of which they complain.

In the case of Cuba, for instance, it is admitted that in former years the sugar industry was profitable in that island, yet import duties levied by the United States were in existence. The Cuban sugar planters were prosperous under the Spanish regime. Why do they not now lay their misfortunes

to the breaking of the Spanish yoke? That seems to be the only political and fiscal condition which has changed in the island. If it be true that their disasters have been as great as has been portrayed, and if we are seeking to benefit Cuba let us lead her back to Spain and apologize to that country for having spent hundreds of millions of dollars and thousands of lives for the purpose of bringing the whole island to the verge of bankruptcy.

When as a boy I studied logic, I was cautioned particularly by the professor to avoid the error of *non causa pro causa.* This is an admonition which the advocates of reduced duties on sugar should take to heart. The cause of the trouble they are fighting is not in the tariff duties of the United States but is in the over-production of sugar due to bounties granted by European countries. Their cause should be pleaded in the parliaments of Europe not in that of America; their plaints should go before the Reichstag, the Bundesrath, and the Corps Legislatif, and not before the American Congress.

The place to plead their cause is before the Congress of Brussels not before the Ways and Means Committee of the Congress of the United States. It is impossible to see where the granting of free sugar will help them in the least, as long as the conditions which threaten all sugar industries of all countries continue to exist. Under legitimate trade conditions demand and supply regulate this matter. Take the bounties from sugar and one large crop overstocking the market will be neutralized by a short one and the equilibrium will be restored, and thus an average, fair remunerative price for raw sugar will be maintained throughout the world.

Continue the bounty system and no reduction of duty, no reciprocal favor will ever be able to establish the legitimate price for raw sugar. Hence all the arguments for reduction of the duties are based on false premises and absolutely fall when the props which are holding them are removed.

Sir Nevile Lubbock says that the customs duty on sugar imported into Germany is £20 per ton, whilst the excise duty is £10 per ton. In the case where the production is in excess of the home consumption it is thus possible, by joint action on the part of all producers, to maintain a price of sugar £10 per ton above the export price, plus the excise duty. Does this amount to an indirect export bounty such as can be taken in view by the Brussels Conference?

Theoretically, where the customs duty exceeds the excise duty, there are three conditions possible:

1. The production may be below the internal consumption.
2. The production may be just equal to the internal consumption.
3. The production may be in excess of the internal consumption.

1. In the first case no kartel would exist since the price

would of necessity be the external price, plus the customs duty. This is now the case in the United States.

KARTELS AS BOUNTIES.—2. In the second case, if the production was in one hand, clearly no combination would be necessary, provided that the one producer had no competition to fear, but this is a state of conditions which nowhere exists. Obviously, if the profit was no more than that which is barely sufficient to keep the industry going, there would be no competition; but, if the profit was in excess of this, competition would commence, and the production would, at once, become in excess of the consumption. This excess would have to be exported either with a diminished profit, or with a loss. The excess would and must (economically) go on increasing until the amount of loss, on the excess exported, reduced the profit made by the portion of the production sold internally to such a sum as, together with the profit, or reduced by the loss, on the export, was merely sufficient to maintain the whole production.

The profit fund derived from the internal sales must be drawn upon to raise the profit, or to make good the loss, on the exported portion.

It must be admitted that a producer who exports sugar below his cost of production, plus the necessary profit, and who receives from any fund a payment which recoups to him the difference between the export price and such cost of production, receives a bounty.

3. The third case is that which has arisen, Germany produces 2,100,000 tons and consumes about 750,000 tons. Theoretically, all we need say is that she would not continue to produce this quantity, as a whole, unless the necessary profit, to which I have alluded, was received on the whole production. But, practically, it is a valuable object lesson. The present export price of German sugar is £7 5 shillings per ton. The price of the same sugar for home consumption is (exclusive of duty) £12 per ton. The cost of production, all round, may be taken at £9 per ton. The bounty on export sugar, irrespective of the Kartel, may be taken at £1 5 shillings per ton. All these figures are approximations, but they are near enough for the present purpose.

It will at once be seen that the exporter is losing 10 shillings per ton on all the sugar he exports thus, price realized £7 5 shillings; add bounty, £1 5 shillings: together, £8 10 shillings; cost of production, £9; loss, 10 shillings.

On the other hand, he makes a profit of £3 per ton on what he sells internally, thus, price £12; cost of production, £9; profit, £3.

Now, what is the position of the industry as a whole? We have 750,000 tons sold at a profit of £3, is £2,250,000; and 1,350,000 tons sold at a loss of 10 shillings, is £675,000; net

profit, £1,575,000, or about 15 shillings per ton on the whole production.

It is evident here that the loss on the export is paid for by the profit under the Kartel.

It may be said that the Kartel is after all a private arrangement with which the conference cannot interfere. But this is not so. The Kartel is only possible under conditions which the government only can create, viz., an appreciable difference between the customs duty and the excise duty, or a high customs duty and no excise.

The remedy is that exporting countries shall undertake that their customs duty shall not exceed their excise duty. In the case of any country which produces more of a commodity than it can consume and in consequence has an excess of production which must be exported, protective customs duties have no effect in raising the price to the consumer and thus operating as a protection, except in the case of a combination such as the Kartel. If, therefore, they have any *raison d' etre* that *raison d'etre* can only be to make possible the formation of a Kartel. Hence, in such a case, the government is not only *particeps criminis,* but the *fons et origo mali.*

It is thus seen that unless some action is taken to put an end to the Kartel system, the abolition of direct government bounties might be quite nugatory; since, while abolishing the direct bounty with one hand, it would be easy to give an equivalent bounty with the other, by means of the Kartel system.

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HOW TO INCREASE THE SUGAR CONTENT OF THE CANE.

Extract from the proceedings of the Sugar Planters' Association in New Orleans. Held May 8, 1902.

Prof. Blouin: Before I get to the selection of cane, I would like to make a few remarks concerning the statements in the paper about selecting the stubble cane. The food of the cane plant is stored entirely in the top, and the nearer we approach the butt of the cane, the further removed we are from the elements that nourish the plant. This is so much the case that even in tropical countries, where they have no difficulty in germinating cane in a few weeks, and, under favorable conditions, in a few days—I have seen this in the Hawaiian Islands, where it germinated in six days, with selections of top cane, the top is chosen as a matter of economy, but in some places the managers have been decidedly in favor of taking the young plant cane in its vigorous growth, cutting it down, and growing a crop of ratoons, from which they claim better results, though as to whether that is the case, or not, I can't say definitely. However, that cane had longer

joints, and gave them not nearly as thick a stand as that which they would have obtained from their tops or "lalas," as they call them, or sprouts from the upper portion of the cane. These lalas or tops vary from a half inch to an inch and a half, and they give them much more cane than they can possibly harvest under any circumstances, thereby bringing about a survival of the fittest, and forcing a dying out, which is quite noticeable when the plant cane is too thick. In any event, the tops have invariably given better results. We found that the lower portion of the cane was not only much longer in germinating, but after germinating, the cane was less vigorous, requiring a considerably longer time to get under growth and assimilate the fertilizing elements of the soil. As regards the old stubbles, we are getting down to the origin of the cane, the first portion of it that has formed, and the part that reaches the nearest maturity. There is vitality there; there is even vitality in the stubbles of tropical canes that reach full maturity; and in some instances the results have been quite pronounced. But there has been difficulty, not in the cultivation, for the cane has received no cultivation. There are no means of cultivating, other than trenching the land. The land is rocky, and outside of hoeing the weeds down, there is no cultivation.

As far as concerns planting from plant cane, first and second year's stubble, we have at the Experiment Station conducted experiments for thirteen years, planting from plant cane, and taking that plant and replanting from it; then planting from first year's stubble, and taking the stubble from that, and replanting it, and so on. We looked after both in the same way, and fertilized in the same manner, and we have seen absolutely no difference, either in sugar contents or tonnage. We have gone even further in that line. We have selected from large, small and medium cane, to see if we couldn't get a larger tonnage. There are possibly some results, though they are not pronounced, in that the smaller cane gives a larger number of small canes; but as to sugar contents and tonnage, there is no difference.

The Chair: Won't you get a little more stand of cane where the joints are close together?

Prof. Blouin: Yes, but as to small cane we have taken the diameter and not necessarily the height.

The Chair: Didn't you also find that the middle of the cane is better than the tops?

Prof. Blouin: I want to state here that for the last eight years all of our cane has been fall-planted; and we have found almost no difference in the stands of cane from the tops, middles, or butts. Some years we have found, if anything, a slight advantage in the tops. We can't account for that positively, unless it be because of the fertilizer being stored in the top. However, we can't attribute it to that. I wouldn't state

positively that we had absolutely no difference in the stand; but, at any rate, final results have not given any marked difference.

Mr. Dymond: Didn't Mr. Hubert Edson, of Calumet, say that pedigree cane—

Prof. Blouin: I was just getting to that. As to selecting cane from their sugar contents, Mr. Edson, of Calumet, has claimed results approximately 1 per cent richer than from his other canes. That has not been the experience at the Station here, nor in any other country where it has been tried. We have tried the selection of cane for several years, and while the results tend as a rule to show some slight advantage in the selected cane, it has not been pronounced to any extent. The past season, selected canes showed a fraction of a per cent higher sucrose than the poor canes, as well as canes of normal sugar contents. In other seasons, the reverse has been the case, though very slight, and, again, we have found them almost equal. We haven't abandoned the idea of continuing these experiments, and may get some results, but we are doubtful.

Regarding fertilization, we have found in every instance where we have fertilized cane and increased the tonnage, we have decreased the sugar contents. We can increase the tonnage, but not the percentage of sucrose in the juices. We have found that by over-fertilization we have markedly decreased the percentage of sugar, while getting a heavy growth and heavy tonnage. By a normal fertilization of nitrogen and phosphoric acid, using (say) 44 pounds, though even 60 is not too much, we got better results. With potash and other forms of fertilizing ingredients, we got absolutely no results, in any form or quantity.

We have tried industriously for a number of years to put sugar in the cane by fertilizing heavy with phosphoric acid, as some people think we thus induce cane to have more sugar. We have never found it that way. By using one, two and three rations of phosphoric acid, we have found no beneficial results, and no evil results. Using nitrogen, we find that by increasing the amount we increase the tonnage, but we also find that there is a limit to the amount we can apply, which is determined by the sugar contents; for if we increase the nitrogen largely, we decrease the sugar content to such a large extent that it becomes unprofitable to manufacture it.

There is still another question that Mr. McCall touched upon; and that is regarding the seedlings of sugar cane. We brought from the West Indies quite a number of canes developed from the seed or from the tassel, and which had in their native country showed some indication of being better cane than those they were propagating. Of this number, something over 100, there were two that showed with us pronounced results, both in tonnage and in sugar contents. Our re-

sults differ from yours, Mr. McCall; and we also differ in the stubbles. Our stubbles have been uniformly good.

I jotted down here a few notes. First, I will read you some figures regarding the tops, middles and butts. This is the average of ten years' experiments, and is the sucrose contents, the tonnage being about the same. From the tops we got 11.19; from the middles 11.07; and from the butts 11.18. Now, from the same plot and under the same cultivation, with Demerara cane No. 74, which is the green cane we have been distributing, we got 12.59 sucrose and .93 glucose. This is the only season that we have been able to harvest a fair quantity. Demerara 95 gave us 11.72 sucrose and 1.49 glucose; Louisiana purple, 9.80 sucrose and 1.94 glucose; and Louisiana striped, 10.80 sucrose and 1.70 glucose. This leaves quite marked results in favor of the seedling cane.

Mr. Dymond: Did these four canes all enjoy the same conditions?

Prof. Blouin: Yes, sir; absolutely so. As regards the tonnage of the two canes in the second year stubble, harvested the past season, of the 74, we got 21.6 tons, of the first year we got 36 tons, and from plant 38.6 tons. From the 95, second year's stubbles, we got 24.9; first year, 35.9; and plant, 33.

The Chair: We never weighed the cane; we never had enough of it. I was only judging by the appearance.

Prof. Blouin: We made a run this year with the 74 and 95 canes combined, and while we haven't got final results (we have run out only our firsts and seconds and not our thirds) we got pronouncedly better results. I can't give you the exact data right now, but they were better results than from any of our home cane. The canes were not only higher in sugar, but they worked much freer, were easier clarified, and purged much better, than our home cane.

You made some remarks about the selection of beet. In the efforts in the tropics to increase the sugar contents, they are following closely the lines followed in the selection of beet. In the latter, they started with small sugar contents, and by selection have increased it until it has now reached the maximum of 25 per cent; though that is not the average by any means. We have even in Louisiana, at the Experiment Station, had 19 per cent in sugar cane; but it wouldn't seed, and we couldn't select from it. They are also conducting experiments in Java, where they had pronounced results, and in North Queensland, where they had good results. We also started this selection in Hawaii. During my year there, I planted a few million seeds, and I failed to get one to germinate. However, this year they have at the Station there a number which they hope to cross-fertilize and accomplish the result. In the West Indies, with two seedlings, one of 24.7 (?) and another which I can't remember, both of which originated in Barbadoes, they got marked results both in tonnage

and sugar contents, over the home cane, the 24.7 being adapted to their dark soil (I think I am correct) and the other to their red soil.

This method of increasing the sugar contents seems, from our results at the Station and in other sugar countries, about the only method we can rely on or place much hopes in. It has great promise, and we firmly believe that the introduction of the seedlings which we have brought here, will increase the sugar contents.

There is a point I omitted, with regard to stripping the cane. That has been tried experimentally by us, and we found it not only did not give any beneficial results, but it gave absolutely injurious results. In the islands, we looked into this subject quite carefully; and while no absolute experiments have been conducted, there is quite a difference of opinion as to stripping done. It is in one of the dryest portions of the island. The manager claims that he has seen no beneficial results from stripping; that the results are as good, but it is quite an additional cost. Then, on the larger island, Hawaii, where they have practically all of the rainfall, the results are quite pronounced in favor of stripping. Where they have accidentally or been forced to allow the cane to grow without stripping, they have found adhering to it quite an amount of leaf, which was not removed in harvesting, not even in carrying the cane to their mills. They cut the cane in small sections, three to five feet, and put it in flumes, and it is flumed right from the field to the carrier. You can see cane sent that way for 27 miles, loaded on the carrier, the water going down at quite a rapid rate from the fall in the land. They claim that the cane is riper where it has been stripped, allowing the admission of the air.

The Chair: Does it sprout when it is stripped, as it would here?

Prof. Blouin: No; there would be no eyes sprouting as would be the case here. They don't start to strip, as a general rule, until the cane is ten or eleven months old, which is older than wet get it.

The Chair: It is a very dry season?

Prof. Blouin: No; some plantations have as much as 200 inches of rainfall per year; it rains every day. The ground, however, is very porous, and it is unusual to see much mud, except on the roads. The fields are comparatively dry ten minutes after a rain. The soil on the rainfall plantations is also rather thin, reaching bedrock in a very short time. All the bedrock is porous, so that the rain percolates into it, so that, with the exception of the largest, Hawaii, there are no rivers. There are some streams that run during freshets, and in the rainfall districts there are streams, but after the cessation of rain the streams stop.

There is also quite a marked difference in the sugar con-

tents of cane of the same growth. On one sugar plantation, the average was 19.20, while on the Ewa, which is the banner plantation in the islands, the average last year was only 11 tons per acre, with sugar content a fraction over 14 per cent; requiring about 8 tons of cane to make a ton of sugar, or about 250 pounds of sugar per ton of cane. As to these plantations with high sugar contents, their tonnage of sugar per acre will vary from 2 to 5, requiring 6½ to 7½ tons of cane to one ton of sugar. * * *

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A Trait Worth Cultivating.—Tact is one of the graces that everyone should cultivate; tact in our dealings with others, both from a business and social standpoint, is necessary if we would succeed. It is only the exercise of kindness and good will toward others and doing and saying the things to them we would have them say and do to us. The blunt, outspoken, sarcastic man or woman is not generally the one who has the most friends, even though the good qualities they possess may far out-weigh those of their more tactful neighbor. To have friends we must show ourselves friendly and carefully refrain from wounding the sensibilities of others.

A business man, to succeed, uses tact in his dealings with others, else he would have few customers. He must oftentimes conceal his real feelings in order to build up his business and hold his customers. A social leader holds her power, not by her beauty, wealth or intellect, but by making everyone feel at ease in her presence and by saying only those things which will please and interest. Everything else counts for but little in the social world if tact is lacking. No one likes to have his faults paraded before others nor does he like to have attention called to any little peculiarity of person or speech.

Tact is only the exercise of common sense and the practical application of the Golden Rule. All classes of people need it and if they are not naturally endowed with it, they should cultivate it. It is not necessary to tell a friend who has been sick that he looks "just dreadful," but try to say something cheerful and encouraging. To tell a girl with a sallow complexion, of which she is already very sensitive, that you never saw her look so yellow, is cruel, and so with a countless number of things that might better be left unsaid as they are calculated to give pain or cause mortification. To make friends and keep them requires the constant use of tact and a considerable effacement of self.

THE BANANA TRADE.

The great increase in the use of bananas as a food in the United States during the past thirty or forty years is a fact that can scarcely have escaped the notice of even the most

careless observer. The magnitude which the trade in this fruit has gradually assumed, however, is probably not generally realized outside of the circles directly interested in the trade. In the foreign trade of the United States in fresh fruits, whether exports or imports be considered, imports of bananas have for some years been the most important single factor. This fact is brought into strong relief by the statement that, of late years, the value of the bananas annually imported into this country has been more than three times that of the apples annually exported. In the fiscal year ended June 30, 1901, the record year up to date in the banana trade, the total value of the bananas imported amounted to $6,550,186, while the value of the exports of fresh apples for the same year—exports, too, which had been exceeded only twice in the previous decade—amounted to only $2,058,964.

The United States is dependent almost entirely on imports for its supply of bananas. In the southern half of Florida, it is true, the fruit has been cultivated to a greater or less extent for some years, but the great freeze of 1894 seems to have placed a check upon the industry from which it is slow to recover. The following statement from the biennial reports of the State Commissioner of Agriculture, though incomplete as to returns from a few counties for the last two years, will illustrate the small importance of production in Florida as compared with the trade in general.

Production of bananas in Florida:

Year.	Quantity Bunches.	Dollars. Value.
1890	32,084	15,464
1891	50,822	22,189
1893	67,283	30,229
1895	12,503	6,238
1897	8,799	3,643
1899	3,782	1,795

The chief sources of supply for this fruit are the Central American States and the West Indies; over 80 per cent. of our imports are derived from these two sources and in no widely varying proportions. Costa Rica took the lead of the Central American States in supplying our demands for this product in 1895-96 with exports amounting in value to $574,782. Since that date its annual shipments have increased almost steadily until in 1899-1900, they amounted in value to $1,317,384, or over half the value of the total exports from Central America.

Shipments of this fruit from the West Indies have been considerably smaller in recent years than they were a decade previous. Owing to the disturbed agricultural and commercial conditions during and prior to the Spanish-American war, the imports, notably from Cuba, suffered a great decline, from which recovery is not yet complete. Imports of

bañanas from Cuba, which in 1894 amounted in value to $1,641,387, declined steadily until in 1898, but have since recovered slightly, amounting to $467,345 in 1901. Imports from the British West Indies, which amounted to $1,801,581 in value in 1894, also showed a falling off during the period of disturbance. But they quickly recovered, and in 1901 they amounted to $2,510,283. The value of the imports of bananas from the West Indies for the fiscal years 1897 to 1900 are given below:

Imports of bananas from the West Indies:

West Indies.	1897.	1898.	1899.	1900.
British West Indies	$1,568,483	$1,853,816	$2,756,415	$2,172,449
Cuba	147,133	.....	61,258	158,049
Santo Domingo.	29,125	101,000	152,500	75,590
Total	$1,744,741	$1,954,816	$2,970,173	$2,403,088

The only other countries from which bananas are imported into the Unieed in any considerable quantity are Colombia, British Honduras, and Hawaii. Imports from Colombia have increased from quantities valued at $336,713 in 1891 to a value of $998,830 in 1900. Imports from both British Honduras and Hawaii show a decidedly declining tendency, those of the former having declined from $155,704 in 1891 to $96,179 in 1900, and of the latter from $118,514 in 1891 to $35,877 in 1900.

The advantages of Porto Rico, geographical, climatic, and political, have recently attracted attention to that island as a future source of supply for bananas; it seems easily within the range of possibilities that in the future the island may acquire a considerable portion of this important trade, and by the extension of its banana cultivation, make a valuable addition to its commercial resources.—Government Crop Reporter.

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SEVENTH REPORT OF THE SUGAR BEET GROWING EXPERIMENTS.

In Great Britain and Ireland, Carried out and Conducted by Sigmund Stein, Manager, Sugar Refinery, Liverpool.

In continuing my experiments of sugar beet-root growing in the United Kingdom I have the honor to publish today my seventh report thereon. The great progress which has been made in sugar beet-root growing in the United Kingdom can easily be seen by comparison with my previous reports. Practically better results have been achieved year after year, and the farmers who continued these experiments have now nothing to learn from their Continental confreres in the art of sugar beet-root growing.

The same as in previous years, different soils and manures

have been used in these experiments, and the variety increased by the distribution of different kinds of seed cultivated under different circumstances.

In regard to the manuring, very interesting experiments have been carried out. By the kindness of Chemical Works, late H. and E. Albert, Agricultural Department, London, I have been enabled to carry out a series of experiments with basic slag supplied free of cost by them. In a number of the experiments, especially in those carried out on light soils, kainit was also applied to the plots dressed with basic slag, and was supplied gratis by the Agricultural Office of the Potash Syndicate. As will be seen from the tables below, the beet-roots grown on soils manured with basic slag—or on light soils with basic slag and kainit—show excellent results, and compare favorably with those roots not so treated. I do not think that such extensive comparative experiments in manuring beets with basic slag and kainit have ever been carried out before in this country.

The results received bring me to the strict conviction that basic slag is an excellent manure for sugar beet-roots, to be supplemented, specially on light soils, with kainit. The beets benefit by such manuring both in respect to saccharine strength and weight, and I am so encouraged by these excellent results that I shall recommend in future my farmer friends to use these manures. I may say that many of them agree with me in regard to my judgment as to the use of basic slag.

The time of vegetation has been the same as in previous years, viz., from 140 to 200 days. The weather was not favorable for sugar beet-root growing, and the results being so very satisfactory, it must be said that this year's experiments have been the greatest success of any year yet. As will be seen from the table below, experiments have been carried out in all parts of England, Scotland, and Ireland, and great thanks are due to all the gentlemen who supported my experiments, partly in planting and growing sugar beet-roots, partly in inducing their friends to do so, and, lastly, in trying to induce others to take an interest in my scheme.

The great success of beetroot growing in the country encourages me to continue same next season, and more so as I have been asked to do so by gentlemen who have planted beet-roots this year, and many others who will grow beet-roots experimentally for the first time next year.

This year there have been 89 experiments in the United Kingdom, of which there were in—

England . . . . . 57 experiments.
Scotland . . . . . 4 "
Ireland . . . . . 28 "

and the result of these experiments is as follows:—

	Average Analysis of British grown roots year 1901.	Average Analysis of German grown roots, year 1901.
Average weight of roots with leaves [in grammes]	1441	1112
Average weight of roots without leaves [grammes]	851	621
Degrees Brix [dry matter]	19.38	17.66
Specific gravity	1.080	1.073
Quantity of sugar in 100 parts juice	17.02	14.76
Quantity of non-sugar in 100 parts juice	2.36	2.90
Quotient of purity	87.82	83.53

As figures speak for themselves, I leave it to the reader to draw his own conclusions. Everyone can clearly see the importance of sugar beetroot growing in these islands. After these very successful experiments I do not think there is any doubt about our climate being suitable or about the ability of our farmers for growing beet-roots. As I have proved in my previous publications, there is no need to be frightened of not getting sufficient labor in this country for carrying on beet-root growing.

I regret that, in spite of my instructions and warnings, dozens of people sent me beet-roots for analysis without any trace of sender's name. All parcels of roots sent me were analysed, but it is impossible to publish the results without having more particulars. I have received many letters from my farmer friends urging me to let them have reports on beet-roots sent, but I cannot now do so after such a long time, as I am unable to trace same. I would ask them in future to be very careful in labelling their samples properly, and to put their name and address on every lot, as well as marking and naming the seed. In future roots grown from different kinds of seed must be packed up separately, as they easily get mixed up when sent all together. It is also very important that the leaves should be attached to the roots, and not sent, as in many cases this year, without leaves. I would also beg my friends to send me only properly washed and clean roots.

As regards the tonnage per acre, the British-grown roots this year, in tons of roots, without leaves, per acre:—

	Tons per acre.
In 1901	19.4
In 1900	19.1
In 1899	16.9
In 1898	16.3
In 1897	16.7

With regard to the amount of juice, the roots contained on an average:—

Juice	93.8 per cent.
Pulp	6.2 per cent.
	100 per cent.

With regard to the contents of glucose, I have only found traces in reference to Nos. 19, 26, 78, and 86.

The sugar beet-root growing question comes in close contact with the sugar question generally, and I am sorry to say we find ourselves in a very critical position this year in this regard. Over-production in beet and cane sugar has brought about a crisis the like of which has never been seen before. Sugar now rules at such a price as to spell ruin to the manufacturer. Of course, such a state of things cannot last long, as there is no manufacturer in the world who will make sugar for the benefit of the consumers only and for his own loss. A remedy will be found very soon, because they will not go on losing money forever. It is to be hoped that next season will bring about a reduction of beet-root growing on the Continent of from 20 per cent. to 30 per cent., which will certainly counterbalance the accrued stock and visible supplies which are generally carried over from one season to another, and sugar will then attain its proper price, which will enable the manufacturer to the sugar beet-root grower to live and prosper.

Of course, sugar beet-root experiments are not only carried out during a brilliant commercial season, but also those seasons of critical aspects. My experiments are to prove conclusively that sugar beetroots can be grown successfully in these islands, and quite as well as on the Continent of Europe, with as much profit to the British farmer as to the Continental agriculturist.

I will allude to the remarks of the Right Hon. Earl of Denbigh with reference to the beet-root experiments carried out at Newnham Paddocks, in which he stated that, considering the great tonnage of the roots and the satisfactory analysis of same, according to his convictions, sugar beet-root growing can be carried on at a profit by the British farmer. I quite agree with his lordship, and may add that from the correspondence in my possession from many leading British agriculturists that beet-roots can be grown in this country to any amount if sugar beet-root factories are established and fair play given to the British farmer, with the same advantages as the foreign sugar producers and manufacturers. British farmers, manufacturers, and capitalists would soon find the way, and would carry on this profitable industry if factories were established.

As I am writing this article an international conference is being held in Brussels to discuss the question of the abolition of sugar bounties, and I hope that same will come to a satisfactory issue: satisfactory to the continental farmers, manufacturers, and exchequers, and also satisfactory to the British farmers, manufacturers, and capitalists.

Let us have fair play; put us on the same footing as the foreigner; let us be at home in our own country; give us the same

rights and no less than the foreigner enjoys in this country. Have we no right in our own country to have the run of the market for ourselves? How long shall we suffer and be the laughing-stock of the world? The foreigner comes here and undersells the Britisher, and one industry after another is going to the wall in consequence, for the benefit of continental enterprise, which countries consider the British market as their best.

If we are a free trade country, let us have free trade, but free trade in general, and not a one-sided free trade. Factories have been erected in this country before, but, as I have mentioned in my previous publications, these have been failures, the reasons for which I have already explained. There has been blunder upon blunder crowned by mismanagement.

As soon as free trade is established in this country in a proper manner, and we are put on the same footing as the Continental farmers, let us start factories, erect them in proper places, have them properly managed, with a proper supply of sugar beet-roots, and capitalists need not fear for their success. We are the greatest sugar consumers in the world, and we can become the greatest sugar producers in the world.

Look at America, from small beginnings the American sugar industry has grown from day to day, and very soon the United States of America will produce 200,000 tons of beet-root sugar per annum. Don't let British enterprise be shattered by American enterprise. Up to now London is the center of the sugar market of the world; don't let London soon be changed for New York, and be ruled from America. England rules the waves, and must also rule the sugar trade.

We are patriotic enough; let our patriotism show that we can afford and wish to have home industries and home-manufactured sugar. I have mentioned in previous publications what benefits would be derived from the sugar industry if established in this country. How many hundreds of thousands of men, women, and children would find employment year in year out? The engineering, building, and allied trades would all benefit to a large extent. To cover the wants of this country 400 factories would have to be established, and not to mention the great importance from a national political standpoint great benefits to British agriculture would undoubtedly follow from the growing of sugar beet-roots.

I have before proved all these assertions by facts from the Continent, where the sugar industry celebrated its 100 years of existence not long ago.

We have everything in our favor in this country, proper climate, labor, educated farmers, capital, consumption, and factories only are needed under effectual organization. It needs only a few influential gentlemen to bring the scheme forward and its success is assured. I think the British agri-

cultural societies should take the matter in hand, and start a sugar factory to which the farmers should supply the roots.

Let us hope that the time is not far off when we arrive at the same standpoint in regard to the beet-root sugar question, as Germany was at exactly 100 years ago.

SIGMUND STEIN.

Liverpool, January, 1902.

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TO IMPORT JAPANESE RICE FARMERS.

Mr. Sadazuchi Uchida, Consul General of Japan at New York, who arrived here Tuesday, put in the day making inquiries as to lands and conditions around Houston with the view to ultimately locating a Japanese colony of rice farmers in this section. A serious condition confronts the agricultural people of his country. Forty-five million population is crowded into an area of 150,000 square miles, or 100,000 square miles less than the State of Texas with a population of only 3,000,000. The government finds it necessary to discover an outlet for a part of this population, or at least to afford some escape for the younger generation who have no opportunity at home to make fortunes. The great population logically makes the prices of lands so high that it is practically impossible for a man to get a start in life as is done in this great Western country. It is Mr. Uchida's idea to bring to Texas farmers in fairly prosperous circumstances; that is to say, men who will come prepared to buy and build their own homes.

"Of course," he said, "I do not undertake to determine the matter. I am only making an investigation and shall report to my government. It is my idea to first bring out a dozen or a score of families, have them conveniently and comfortably settled and if they make a success and are satisfied I can bring as many as we can find cheap lands to occupy. I would not have the Texas people understand that the Japanese immigrants whom I have in mind are laborers of the class commonly represented by the Chinese immigrants. It is only the poor of China who leave their country; the well-to-do remain. But with the Japanese the thrifty and the ambitious are seeking new fields and the class who would come to Texas in this venture are farmers who are intelligent, educated, of good moral character, and industrious habits, who will expect to come here and become American citizens. You know we are proud to be called the Yankees of the East and I feel quite sure that by the second generation the Japanese here would be thoroughly Americanized."

Some idea of the handicap under which the Japanese rice farmers labor may be obtained from the statement that lands are worth hundreds of dollars per acre and the farmer who rents pays one-half of the total yield to the landlord. Under

these circumstances it is impossible for the most industrious to obtain more than a bare living from his labor, and these broad acres in Texas at low prices and at cheap rentals have awakened the desire in the Japanese to come to this section. The class of whom Mr. Uchida refers are expert rice and fruit farmers, and it may easily be seen that they would be of great value to South Texas for the knowledge they possess of these industries.

Mr. Uchida did not stop with inquiring about lands and climate, but was particular to ascertain how his people would be treated by the residents of this country. He makes it quite clear that they are intelligent, respectable people, not in any way to be classed with the cheap Chinese who have caused so much trouble on the Pacific Coast, and he plainly has in mind establishing this fact before they come, so that they will be treated with respect. He was particularly interested in the laws of Texas as to homesteads, the school fund apportionment, and all such matters which go to make up a successful and happy social life.

Mr. Uchida is a man of fine address and liberal education. He speaks English with only the slightest hesitation for the right word occasionally. He is proud of his country and its late achievements. To the Japanese all Americans, or citizens of the United States, are "Yankees," and with respect to this designation, a Post reporter asked:

"Will your people who come here retain their native customs and habits and be clannish, or will they adapt themselves to Western life? That is, will they remain Japs or will they become Yankees?"

"They will become Yankees," he answered, quite enthusiastically.—La. Sugar Planter.

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THE SHIPPING OF MANGOES.

(By John W. Harshberger, Ph. D., Philadelphia.)

The traveller from temperate countries in first visiting the tropics is naturally much impressed with the large number of new and untried fruits which he meets with on every hand. He tests them all, and after his experimentation has gone on for some time, he generally reaches some conclusion as to those fruits which suits his fancy best. Almost universally, the mango is chosen as one of the most desirable of the "new" fruits tried. If this is so, why do we not find the mango for sale in the fruit stores, markets, grocery stores and fruit stands of the cities and towns of the United States? It is due, on reason, if not familiar with the facts, to the imperfect or decayed condition of the mangoes when they reach the northern ports of consumption. Is this so, or is the scarcity of this

delicious tropical product due to the lack of energy and business capacity on the part of tropical agriculturists?

This article is written as in part an answer to the above questions, and is based upon actual experiment—the writer having recently visited Haiti and Jamaica on a botanical excursion. A little history will be of some help in this discussion. According to the Pomologist of the United States Department of Agriculture (Bulletin 1, Division of Pomology): "No fruit stood higher in the popular esteem of people in parts of South Florida than the mango. When the disastrous freeze of January, 1886, occurred, every or almost every tree north of Fort Myers was destroyed. In 1884, 126,968 mangoes were shipped from Jamaica to the United States and brought $900. In their eighth year from seed two Florida trees bore 19,000 fruits. Some of these fruits weighed a pound. Mangoes were shipped to Chicago and brought 60 cents a dozen." So much for the history of the first introduction of the mango as a fruit, into the market of the United States.

The experiment to be described was conducted by the writer during his return from Port Antonio, Jamaica, by steamer to New York, and thence by rail to his home in Philadelphia. A number of different sorts of tropical fruits were brought by special arrangements on Monday, July 22, 1901. The list of picked fruits, etc., as packed for a shipment, comprised plantains, pineapples, oranges, limes, mammee-apples, yams, bread-fruits, guava, papaws, sour-sops and mangoes. In one box or crate, no especial care was taken in the packing—all of the above named fruits, etc., being nailed up together for transportation. In another box, the mangoes were each wrapped in a piece of newspaper, and carefully packed away in a rather close and partially ventilated case. Two dozen, or more of these fruits in the green state were thus shipped, along with the others to Philadelphia. An inspection of the open, well-ventilated crate, when two days out at sea, revealed a total collapse of the breadfruits and the sour-sops, which had become soft and mushy, and were consequently thrown overboard. The other fruits carried well—the mangoes best of all. Those mangoes packed in the open box were all more or less in a mellow condition, while those in the closer box, (wrapped with paper) were firm and sound, although fully ripe. In all cases the fruits of the common sort, "the turpentine mango," were found to have changed from the green of unripeness to the golden orange of the fully ripe mango. Ten days elapsed before the boxes were opened, so that the test made fully establishes the possibility of shipping mangoes to the larger cities of the American Republic. It should be borne in mind, that the test was a severe one. Without a doubt, the mangoes had been collected the Saturday before the writer sailed, July 20th, and kept over Sunday

until Monday, when they were bought and packed. The steamer sailed from Jamaica Tuesday afternoon, July 23rd, and reached New York Monday morning, July 29th, where the boxes were expressed to Philadelphia, reaching the home of the writer on Tuesday afternoon, July 30th. The last mango was eaten on Sunday, August 4th, so that fully fifteen days had elapsed from the time of gathering until the date of final consumption.

No doubt a variety of mango can be found which will carry even better than the ordinary kinds sold by the negro women in the markets of Jamaica. From information gleaned from Mr. William Fawcett, director of the Botanic Gardens, and from Mons. Charles Patin, Consul General of Belgium, to Columbia, the writer believes that the finer varieties of mango are not known in cultivation in Jamaica, but are only to be found in experimental grounds and in botanic gardens.

Two elements are, therefore, needed to make the cultivation of mangoes, a profitable undertaking. The first thing necessary is a suitable variety of mango—one that has little fibrous material attached to its seed, one that will carry well and last a long time, and one which is juicy and possesses that delicious turpentiny flavor. The second requisite is a company to push the cultivation, and who will see to its advertisement and general introduction into the markets of the United States.

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THE MANUFACTURE OF PAPER FROM SUGAR CANE REFUSE.

F. C. Thiele, in the Chem. Zeit., describes the process of paper-making from sugar cane refuse used at a large works in Texas. The woody fibre, etc., from the diffusion battery are the raw material; they contain 82 per cent. of water, 16.5 of crude cellulose, 0.75 of carbohydrates, and 0.75 of mineral matter. The ash contains silica, 82.77; ferric oxide, 6.65; alumina, 3.69; chlorine, 0.82; phosphoric acid, 1.48; and potash, 4.32 per cent. It is thus the silica which must essentially be removed. If the chips be boiled at once with soda and lime under pressure, inconvenient foaming subsequently takes in the beater, the mass is washed with difficulty, and the moist paper sticks to the hot roll of the paper machine. These difficulties are overcome by allowing the chips to ferment in heaps, the process being assisted by frequent watering. The pectins are thus destroyed; valerianic acid is formed, probably owing to the decomposition of the albumins. The fermented chips are then taken by a conveyor to a "rotary," a spherical vessel of steel plate, turned by cogwheels at the rate of seven revolutions per minute. The charge of the "rotary" is 40,000 lbs. of chips, to which are added 450 lbs. of dry soda and 200 lbs. of dry quicklime; the chips contain

sufficient water to dissolve the materials completely during the boiling process. The mass is boiled by direct steam at a pressure of 90 lbs. per square inch during four hours, the "rotary" being in continuous movement. Steam is then blown off, the contents allowed to drain on a large wire sieve, and then transferred to the beaters, where they are thoroughly washed. The pure cellulose is then brought into large tanks, from which it is fed to the paper machine, first passing through a "knot-catcher," which retains large pieces and mechanical impurities. The material is not sized, and rosin is not added, since the paper is sufficiently strong and writing paper is not made. The original material appears to contain some unfermentable substance (pith), which gives to the paper in the later stages certain properties which make it similar to sized paper. The daily output is 24,000 lbs. of brown paper, suitable for packing purposes. The paper is very strong, and possesses a fair resistance to the penetration of water. In a single season (the summer months) 8,000,000 lbs. of paper are obtained from 40,000,000 lbs. of chips. The paper sells at two cents per lb. The material obtained from the soda process requires, for bleaching, too much chloride of lime to make the operation profitable. The author has, however, found that, if the material from the beater be treated with sulphurous acid, the brown decomposition products contained in the cellulose become soluble. After well washing the mass may then be bleached snow-white by small quantities of bleaching-powder and alum. It may then be colored by organic dyestuffs or by insoluble pigments.—Kuhlow's.

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THE SAN JOSE AND OTHER SCALES.

It is not putting the matter too pessimistically to say that all the experiments for the extermination have thus far been failures. Almost every entomologist, horticulturist and practical orchardist in the country is by this time on record as having said that extermination is now out of the question. It is perfectly impossible to clean the insect out of any locality where it has secured a residence, and almost equally impossible to clean up even a single orchard where the infection has progressed to any serious extent.

We have been brought face to face with this problem. We have come to see that the question hereafter will be that of keeping the insect in check. This will depend not on legislation nor on the restriction of the nursery business, nor upon any of the proposed methods of extermination, but upon such local treatment as the orchardist himself shall be able to give. When the San Jose scale once makes its appearance the whole discussion is at once taken out of the courts. It is removed from the hands of the nurseryman, and is put absolutely and forever into the hands of the orchardist.

Three principal methods of orchard treatment have been suggested. These are, first, the crude petroleum treatment; second, the oil and water treatment; and third, the lime, salt and sulphur treatment.

According to the first treatment, crude petroleum is sprayed on the trees in winter or early spring, and is fairly effectual in removing the insects. When properly done under favorable conditions, the trees are practically rid of every scale. There seems to be some danger, however, in applying this remedy, and in certain cases almost disastrous results have been recorded. Many trees have been killed by it, while in other cases no damage at all has occurred.

In the second method, kerosene is mixed with water in a mixing pump and sprayed on the trees in a 20 or 25 per cent. solution, during the winter or early spring. This is said to be less dangerous and equally effective. There is some question however regarding the matter of danger. Some persons have found trouble with this spray, and some have even said this was more dangerous than the crude petroleum test. All these points remain to be settled by wider experience.

The third method which has been suggested is rather extensively practiced. It consists in applying during the winter of 40 lb. of unslaked lime, 20 lb. of sulphur and 15 lb. of salt, boiled in 60 gallon of water, and applied hot. This spray is fully as difficult to handle as those already named, but it has some advantages of its own as well as some disadvantages.

But it must be said that we have not sufficient light on the matter of what the best treatment is for San Jose scale in the orchard. Doubtless these various sprays which have been recommended are practicable and fairly efficient when they are properly managed under favorable circumstances.

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WHAT EXPERTS SAY OF SOUTH CAROLINA TEA—DR. SHEPARD'S GARDENS.

Southern enterprise and energy are not rated very highly in most sections of this country, and yet the history of American agriculture will reveal that to the enterprise of this section, particularly South Carolina, it owes much, says a Summerville correspondent of the Chicago Record-Herald.

These reflections follow a visit to the Pinehurst tea gardens at this place, where according to a declaration of Secretary of Agriculture Wilson, made a few days ago in cabinet meeting, "the best tea twenty-two miles from the spot where the first grains of rice were planted in American soil, forty miles from the plantation where the finest Sea Island cotton is grown—the substitute for silk—and in the section where fortunes were made in indigo in the olden days, are the tea gardens of Dr. Charles U. Shepard. Here for just ten years he has worked and experimented, groping in the dark very often for the

secrets of the tea growers of the Orient. The difference in rainfall, the difficulties of labor, and other problems less serious, but whose solution was requisite for final commercial success have been met and overcome.

Twenty years ago Congress made an appropriation for an experiment in tea culture, but the money was injudiciously expended, and on the report that there was little prospect of anything of value being accomplished the experiment was closed. Recently, recognizing the value of Dr. Shepard's work, the Department of Agriculture has given him hearty support, bearing much of the expense, and making him the department's special agent.

Experiments were begun on a small scale, and were necessarily expensive. Success has been achieved, the gardens are now paying a fair profit, and have not yet reached their full growth. "Knowledge has been gained," says Dr. Shepard, "and a path opened, but only to reveal more room for continued application and study." Experiments have not been confined to those varieties that promised most remunerative returns, but other seeds that seemed to require different conditions have been given trials, the effort being always to increase the productiveness, as there lies the profit.

These tea gardens in February, 1899, endured conditions seldom experienced in the South when the mercury fell to two degrees below zero. The gardens had no protection from the weather, and it was feared they were ruined, but they have now entirely recovered. After the freeze, the bushes were pruned liberally. Of course this temporarily affected their productiveness.

Considering that Americans use so much tea, astonishingly little is known about it. The multi-millionaire pays little more for his tea in America than the poorest laborer; the difference in price is not more than a half cent a cup. In the East the millionaire's tea may cost him from 10 to 25 cents a cup, and the coolie may get fifteen or twenty cups for one cent. This is because the tea for the most delicious beverage of the Orient cannot be transported. The tea we pay 75 cents to $1 a pound for is delivered at the Chinese ports for about 15 cents, yet the best tea sells in China at about $50 a pound. It is not surprising, therefore, that an American tea garden has already produced and given to Americans the finest tea ever drank in this country.

Experiments have been made with both black and green teas, the same garden in some cases furnishing equally good tea of both varieties, the difference being in the manipulation of the leaf. As to black tea, Dr. Shepard thinks the "South Frazier" garden has made a remarkable showing. It contains two acres. The bushes were planted four feet apart and were from seeds procured by United States Consul Fowler, at Ningpo, China, in 1892, from the celebrated garden in the province

of Chekiang. Consul Fowler wrote that the tea was of the "very best." "Only Chinese can afford to use it; it is too dear for those in America," added Mr. Fowler. This black tea would cost in the United States about $12 a pound. The garden at Pinehurst yielded in 1894, 85 pounds, two years later, 215 pounds, and last year over 500 pounds. There are few gardens in China that yield over 200 pounds of dry tea to the acre.

The "Rose Tea Garden" is a little less than an acre, and produced last year 1,200 pounds of green leaf makes 300 pounds of standard Pinehurst black tea, for which there is an established market of $1 a pound.

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A QUEENSLAND MOTOR CANE-CUTTER.

In view of the report received from Bundaberg to the effect that a newly-invented cane-cutter had been successfully tried on the Qunaba plantation, inquiries have been made for some further particulars. It appears that the inventor is Mr. J. A. Smith, a young man already well known in the cycling world, a member of the firm of James Smith & Sons, of this city. It seems that his attention was first attracted to the problem by seeing in one of our leading foundries a colossal piece of machinery which lay unfinished in an out of the way part of the yard. The attendant, a fully qualified engineer, in reply to a word of inquiry from Mr. Smith, explained that this contrivance was an abandoned sugar cane harvester, which had been forsaken by its patentee for two prime reasons: 1. Undue cost of machine. 2. Its unwieldiness. Mr. Smith hereupon gave it as his opinion that owing to the undulating nature of the cultivations and the varying heights of the sugar canes, it would be quite impossible to cut and top the sugar crops "en masse," after the fashion of a reaper and binder at work on a field of wheat. He accordingly set to work upon a machine of quite a different type, and has apparently succeeded. Thus, through some other man's plucky though unsuccessful attempt, was a train of thought set in motion, which has developed into a labor-saving appliance which may yet revolutionize an important industry. This machine will be known to the world at large as "The Smith Premier Cane-cutter and Topper."

The following are some of its claims to merit: 1. The operator, who requires no special skill, will not have to stoop to work the machine, thus his energies may be continued without any wearing strain or after effect. 2. The machine will cut fallen or standing cane below the soil, if necessary, thus preventing any tendency towards loss of crop, through the short cutting of sticks; while the expense of cleaning, trimming, and hoeing the stools after the cane has been taken off will in a great measure be eliminated from the farmer's calculations.

3. The motive power is such as to offer no danger of fire, as the flying sparks of a steam engine would do. 4. Portability is one of its special features, as it requires no heavy paraphernalia on the field, being of such proportions as to be easily operated from a plow-furrow, and drawn by one horse. 5. Durability, interchangeability, and simplicity. The cutters may be removed and re-sharpened or exchanged on the field by a novice without having recourse to the workshop. 6. A rapidly revolving fan throws a forced draught of air right on to the workers. 7. Where the electric system is chosen as the motive power, incandescent lamps or arc lights will permit of two or three shifts of men being kept constantly at work—thus the mill will be well supplied and have little or no idle time during the sugar season, as heretofore. 8. The machine may be of the one, two, three, or four cutter variety; or may have cutting and topping knives mounted on one carriage. A model cutter, electrically driven of the first type, working one knife or saw, at a preliminary public trial held at Qunaba plantation, Bundaberg, cut three stools of stand-over cane, containing twenty-two stick, in ten seconds. Taking the average weight of each stick as 6 pounds, which is within rather than over the mark, the result gives 15¾ tons per hour, or 945 tons per week of sixty hours. Bearing in mind that a heavier design of machine would mount a number of cutters, and allowing for two or three shifts of workman per day, trained to skilfully work the same, the results attained would be proportionately greater. 9. The topping device acts with precision, and can, be fed by boys. 10. The tops of sugar cane sticks so treated will be passed on to the "crushers," which will reduce this vegetation to chaff, and may be gathered up for ensilage, fodder, etc., or scattered broadcast over the land as a manure, thus aiding the cultivators to improve and enrich their property, while the attendant refuse of gathering the cane harvest under the old method will be a thing of the past.

By this means a useless commodity will be turned into a marketable article to balance cost of introducing the machine. The labor of plowing in slowly rotting tops will be overcome. And besides this, the grubs which breed and feed on those refuse tops and then attack the cane roots would be more easily dealt with.—"Queenslander."

ANOTHER CANE CUTTER.—In the report furnished by Dr. Maxwell to the Austrian Federal Government in reference to the sugar industry, allusion is made to a mechanical device for the cutting of cane, which allusion has excited much interest among the Queensland sugar growers. Dr. Maxwell stated that the author of this contrivance is now in the United States of America, seeking facilities for the making, perfecting, and testing of his device. On inquiry we learn that the

gentleman in question is Mr. Herbert Paul, who some months ago, went to America with a patent which covered certain ideas he had formed, as a practical man interested in cane-growing on one of our northern rivers. From information just received from Washington, there is every hope that the object which has so long engaged the serious attention of sugar growers has been carried into effect. We understand that the invention consists of two parts, namely, the motive power which is pneumatic, and a suitable machine containing a cutter, to which a reciprocating motion is imparted, and which may be operated whilst held in the hand. The leading pneumatic tool company in America very soon produced what was regarded as a perfect apparatus for the motion required, but the difficulty arose in deciding the kind of knife, or cutter, which should be attached to it. Mr. Paul referred the problem to Disston's, the well known saw and knife manufacturers, and a quantity of sugar cane was operated upon for purposes of experiment. A knife, with teeth like a saw, was tried, and also a circular saw, but both proved utterly useless for the work to be done. The reasons for this were: (1) The power required to hold the knife against the cane to be cut. (2) The extra weight of the machine itself for imparting the rotary motion. (3) The blunting of the saw by cutting the cane and coming in contact with the earth. (4) The extra power required to operate it (the rotary motion). (5) The skill labor, and time required to sharpen the toothed cutter. One of the experts who conducted the experiments reported: "The reciprocating and rotary cutter with teeth saw is a failure." The upshot was that, after several trials with the saw principle it was discarded by the experts as valueless. Under these circumstances, the experts and Mr. Paul thought out a form of tool in the shape of a cutter without teeth, having a reciprocating motion of between 500 and 1,000 strokes a minute. This was found to cut the cane at the rate of about two seconds per stick. The operator simply holds the instrument in his hand and applies the cutter to the foot of the cane stalk, cutting cleanly through the cane and any leaves or debris, level with the ground. It is considered by experts that such a cutter leaves the root stalk in a far better condition for ratooning than is the case with hand cutting, and there is no waste of the best part of the cane, as is often found in rapid or careless hand cutting. The physical labor involved is said to be very slight, and the whole of the power is supplied by the machine, the part held by the operator weighing not more than six pounds. An air-compressing engine of suitable type will be supplied, capable of feeding two pneumatic tools, so that two men can be engaged simultaneously cutting, (or one can be cutting and the other topping cane, for one machine is adapted to both operations, topping to be effected after or before the cane is on the ground. It is impossible to estimate

with any accuracy what the saving will be, but it is believed that with this new combined apparatus, one man will be able to cut four times as much in a given time, as with an ordinary cane knife. It is also thought that with skilled labor, this work will be more acceptable to Europeans, and far less exhausting than under present conditions. Mr. Paul has also devised and patented an apparatus for conveying the cane from the field to the trucks on the main tramline, which, it is estimated, will effect a saving of two-thirds of the labor at present required for this part of the operation. It need hardly be added that these devices have been protected by patents. Mr. Paul hopes to return to Queensland early next month with his machine perfected, and to give a demonstration of its effects, probably in the cane fields near Bundaberg.—"Brisbane Courier."

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Let us call this the Second Chapter. Cane is botanically classed as a grass. The primary method of grass propagation is by the roots. Then, too, we know stubble cane to be sweeter than plant cane, which the writer believes is caused by the fact that stubble cane has more time to grow and mature its juices, for it is already in the ground and established (rooted) when the plant cane is placed in the ground. Again the young canes from stubble roots draw pure mother's milk from the root, as its juice never having been exposed to air and sunlight, stays plant food, whereas the sprouts from the planted cane have to depend on the juice of the mother cane, which juice has to be converted into plant food or mother's milk before available, causing a delay of two to six weeks (being in cold ground), giving this advantage of time to the stubble shoots. For, be it understood, it takes all of this time for the sprouts of planted cane to make roots, when the stubble shoots start out with roots already made, and deriving first nourishment from the stubble roots where, as explained, its plant food or mother's milk already exists in an assimilable form.

Now if it be Nature's primary method to propagate cane by its roots, why not follow Nature's lead and do the same ourselves. Thereby utilizing what is now a waste product and a nuisance to the fields called stubble clumps. Then, to plant these stubble clumps, the detail would be, "off-bar" the rows, split with a middle breaker, load the clumps in carts and dump in field to be planted; here with a hand-axe, or heavy cane knife, these clumps are separated into smaller pieces for planting.

Of course many eyes are thus destroyed, but as these eyes are so numerous and close together in this part of the cane, there will be plenty left. It is a further evidence that Nature intended to propagate from roots, for these eyes are made so numerous at this point of the cane. Now the cane produced

from stubble clumps having received the same care and attention that the other cane received, an equal amount of stubble propagated cane and planted should be selected, juice analysed, and comparisons made; the juice from the stubble propagation should show a higher per cent sucrose. By the planting of this cane for seed, a type of cane should be produced having a higher sucrose content in an increasing ratio. In this connection, the writer, some 15 years ago, having one-half cut to plant and no seed cane, conceived the idea of filling out with stubble clumps—this one-half cut was one and one-half acres. Keeping careful account of the expense, the total to plant, disintegrate the stubble, etc., was $12. It would have cost with cane $4.50 to plant, so the added cost was $7.50. To offset this was the saving of seed cane, say six tons at $3.50 per ton, $21. So, therefore, $21 less $7.50 gives a clear gain of $13.50. This part, however, is one of the least merits. The cane from these stubble clumps, from start to finish, showed a vigorous growth, the greatest maturity and a clear, healthy cane for the mill. Since then, many others, at the writer's suggestion, have pursued the plan, and always with satisfactory results, but, not having apparatus for analytical comparison, data cannot be given. It is the purpose of this paper to ask some of you sugar planters to take up this idea and experiment with it. The cost is slight, in reality nothing, for, while it costs more to plant an acre in stubble clumps, you save the value of seed cane, say four tons at $3 equal $12. it surely will not cost that much extra. Use no commercial fertilizers, or manure, select poor land, for nothing should be done to cloud the main issue or obscure its results.

There is another point in this matter of cane culture needing attention. It is fertilization. In an unholy, vainglorious and reckless effort to make "tonnage," too many, alas! nearly all managers, have used fertilizers to an unlimited extent. They have drugged the pure cane plant, intoxicated it as it were, producing cane of dropsical proportions, with dirty furze.

With the broad field of botany open to all, why not recognize our mother in Nature? Fertilize? Certainly! But not when the plant is growing to stimulate its growth as a plant. But fertilize the soil previous to planting, by putting the elements needed in available form, so when the plant comes to germination it finds the cupboard (soil) stored with food ready for use. Our best known fertilizer is the common cow pea. The cow pea, however, is a summer plant. Now, after a field is planted in cane in September, the whole field should be sowed broadcast in vetches. These vetches are a winter growth, are easily killed off in spring and in dying leave much humus and, as nitrogen storers, are the equal of the cow pea. Then, with deep and thorough preparation, shallow cultiva-

tion (don't cut cane roots'), a matured cane will be brought to mill, rich in sucrose, to repay your toil.—La. Planter.

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SAN FRANCISCO, CALIF., 121 California St., May 23, 1902.

EDITOR PLANTERS' MONTHLY. DEAR SIR: Apropos of the good results obtained on the Ewa Plantation with its irrigation water which contains salt, it may be of interest and value to recall that it is no uncommon proceeding to use sea-water as an indirect fertilizer for sugar cane. Not only is the salt water sometimes placed in the furrows preliminary to planting, but sea-plants, containing large amounts of salt, are a most valuable fertilizer for cane. Even raw salt is admittedly good for cane fields; in some countries those fields most distant from the sea-shore do better when the furrows are filled with salt water. In a recent French technical publication this whole question is quite fully discussed and numerous instances given where most striking results have been achieved; it is thus not at all a theoretical idea, but a plain, practical fact not as yet understood however, hence it is desired that parties "possessing personal information in this regard" will communicate it.

The writer is aware of the reasons assigned for certain failures down there but in view of absolutely valuable results secured elsewhere and considering Ewa's results, is it not worth while that a series of field tests be made in a small way? Attention is called in the publication in question that results may vary according to the permeability of the soil, drainage conditions, climate, etc., and altogether much stress laid upon the value of securing scientific data by actual trials.

Where is there a better place to do the same than in the Hawaiian Islands? The writer has not watched the work of your experiment station of late and hence may be in ignorance that the tests are already being made but in any event, it will not be amiss to make the suggestion.

Thanking you for your attention, I remain,

Very sincerely yours,

HUBERT DYER.

P. S.—Some recent investigations in Europe re the coloring matter in raw sugars are of interest to any companies contemplating refining on the plantation.

H. D.

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West Livaudais, of New Orleans, make a specialty of manufacturing filtered press cloths, filter bags, etc. This firm is doing a very extensive business in Louisiana, Mexico and the West Indies, in fact in all sugar producing countries. Any correspondence directed to them will receive immediate attention.